

# ANNUAL WATER QUALITY REPORT

WATER TESTING PERFORMED IN 2016



*Presented By*  
**City of Flagstaff**

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

## Continuing Our Commitment

The City of Flagstaff is committed to providing the highest quality drinking water and reliable delivery to our customers. We are proud to present our annual Consumer Confidence Report, also known as a water quality report, which summarizes all testing conducted to assure we are providing our customers with the highest possible quality drinking water. Our water provided to our customers meets or exceeds all Federal and State drinking water standards. This report covers the period between January 1 and December 31, 2016.

**PWS Name:**

City of Flagstaff Municipal Water System

**PWS ID#:**

AZ0403008

**Owner / Operator Name:**

City of Flagstaff / Brad Hill, Utilities Director

**Telephone #:**

(928) 213-2400

**Fax #:**

(928) 213-2409

**E-mail:**

water@flagstaffaz.gov



## Public Meetings

We want our valued customers to be informed about their water quality. If you would like to learn more about public participation or to attend any of our regularly scheduled meetings, please contact the Utilities Division at (928) 213-2400. Flagstaff Water Commission meetings are held the third Thursday of each month. Meeting locations are posted on the official City bulletin board at City Hall, 211 W. Aspen Ave., Flagstaff, and on the City's Web page at [www.flagstaff.az.gov/utilities](http://www.flagstaff.az.gov/utilities).

## QUESTIONS?

For more information about this report, or for any questions relating to your drinking water, please contact Steve Camp, Regulatory Compliance Manager, at (928) 213-2475, or Thomas Bolyen, Water Production Manager, at (928) 774-0262.

## Substances That Could Be in Water

To ensure that tap water is safe to drink, Arizona Department of Environmental Quality prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration regulations establish limits for contaminants in bottled water. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of these contaminants does not necessarily indicate that the water poses a health risk.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals, in some cases, radioactive material; and substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

**Microbial Contaminants**, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, or wildlife;

**Inorganic Contaminants**, such as salts and metals, which can be naturally occurring or may result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming;

**Pesticides and Herbicides**, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses;

**Organic Chemical Contaminants**, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and may also come from gas stations, urban stormwater runoff, and septic systems;

**Radioactive Contaminants**, which can be naturally occurring or may be the result of oil and gas production and mining activities.

More information about contaminants in tap water and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at (800) 426-4791 or visit online at [www.epa.gov/safewater/hotline](http://www.epa.gov/safewater/hotline). Information on bottled water can be obtained from the U.S. Food and Drug Administration.

## Where Does My Water Come From?

In 2016, the Utilities Division produced approximately 7,979 acre-feet (or ~2.6 billion gallons) of drinking water at an average of 7.11 million gallons per day. This is a decrease of 0.4% from the previous year, 2015.

The City of Flagstaff, produces drinking water from three sources:

1. Upper Lake Mary Reservoir
2. Seasonal runoff from the Inner Basin of the San Francisco Peaks. The water is a combination of spring water from snowmelt and shallow ground water wells.
3. Deep ground water wells located in two well fields outside of town and seven wells located inside of town.

### Water Treatment Process

The City of Flagstaff has two water treatment plants:

1. Lake Mary Water Treatment Plant – Raw water is pumped approximately 9 miles from an intake tower at the Upper Lake Mary dam to the Lake Mary Water Treatment Plant. Water is pretreated with chlorine dioxide to prevent algae growth and formation of disinfection byproducts, water is treated in a conventional filtration plant, consisting of coagulation, flocculation, sedimentation, filtration, and disinfection. Final treated water is mixed with groundwater from the Lake Mary well field prior to being pumped to the City's distribution system.
2. North Reservoir Filtration Plant – The Inner Basin was Flagstaff's original and only water source until 1942. Water from a system of developed springs, infiltration galleries, and three ground water wells is treated at the North Reservoir Filtration Plant. Water enters the plant with a very low turbidity and is treated by filtration, consisting of traveling bridge sand filters, and disinfection. Water from the Inner Basin is seasonal and is typically available from May through September. Once treated, water is pumped to the City's distribution system.

The City of Flagstaff obtained a Designation of Adequate Water Supply from the Arizona Department of Water Resources in 2013. This permit ensures the city has the financial capability to develop necessary infrastructure to meet projected water demands, has obtained water rights to develop its various water supplies, and that the physical water supply is available for at least 100 years.

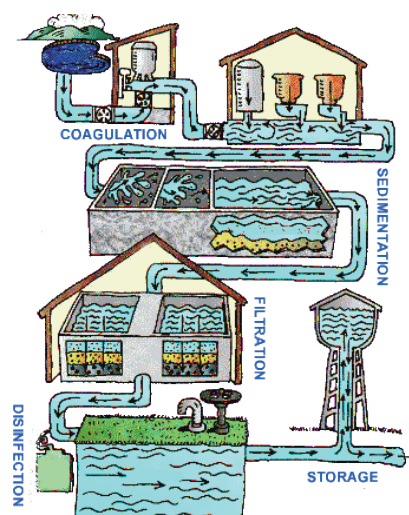
## Important Health Information

While your drinking water meets U.S. EPA's standard for arsenic, it does contain low levels of arsenic. U.S. EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. U.S. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.



Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. Some people may be more vulnerable to contaminants in drinking water than the general population.

Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV-AIDS or other immune system disorders, some elderly, and infants can be particularly at risk of infections. These people should seek advice about drinking water from their health care providers. For more information about contaminants and potential health effects, or to receive a copy of the U.S. Environmental Protection Agency (EPA) and the U.S. Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and microbiological contaminants call the EPA Safe Drinking Water Hotline at 1-800-426-4791.



## Source Water Assessment

Based on the information currently available on the hydrogeologic settings and the adjacent land uses that are in the specified proximity of the drinking water sources of this public water system, the Arizona Department of Environmental Quality (ADEQ) has given a low risk designation for the degree to which this public water system drinking water sources are protected. A low risk designation indicates that most source water protection measures are either already implemented or the hydrogeology is such that the source water protection measures will have little impact on protection



## Fact or Fiction

A person can live about a month without food, but only about a week without water. *(Fact: Dehydration symptoms generally become noticeable after only 2% of one's normal water volume has been lost.)*

A person should consume a half-gallon of water daily to live healthily. *(Fact: A person should drink at least 64 ounces, or 8 cups, of water each day.)*

Methods for the treatment and filtration of drinking water were developed only recently. *(Fiction: Ancient Egyptians treated water by siphoning water out of the top of huge jars after allowing the muddy water from the Nile River to settle. And, Hippocrates, known as the father of medicine, directed people in Greece to boil and strain water before drinking it.)*

There is the same amount of water on Earth now as there was when the Earth was formed. *(Fact: The water that comes from your faucet could contain molecules that dinosaurs drank!)*

A typical shower with a non-low-flow showerhead uses more water than a bath. *(Fiction: A typical shower uses less water than a bath.)*

About half the water treated by public water systems is used for drinking and cooking. *(Fiction: Actually, the amount used for cooking and drinking is less than 1% of the total water produced!)*

One gallon of gasoline poured into a lake can contaminate approximately 750,000 gallons of water. *(Fact)*

## Tests Show No Cryptosporidium or Giardia in Our Drinking Water

The City of Flagstaff was required to test monthly between October 2015 and September 2017 for microbiological organisms, including Cryptosporidium and Giardia, in Upper Lake Mary raw water. Cryptosporidium is a microbial parasite found in surface water throughout the United States. We are happy to report that no Cryptosporidium or Giardia has been detected in our source water.

## Lead in Home Plumbing

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. We are responsible for providing high-quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at [www.epa.gov/lead](http://www.epa.gov/lead).

## Tap vs. Bottled

Thanks in part to aggressive marketing, the bottled water industry has successfully convinced us all that water purchased in bottles is a healthier alternative to tap water. However, according to a four-year study conducted by the Natural Resources Defense Council, bottled water is not necessarily cleaner or safer than most tap water. In fact, about 25 percent of bottled water is actually just bottled tap water.

The Food and Drug Administration is responsible for regulating bottled water, but these rules allow for less rigorous testing and purity standards than those required by the U.S. EPA for community tap water. For instance, the high mineral content of some bottled waters makes them unsuitable for babies and young children. Further, the FDA completely exempts bottled water that's packaged and sold within the same state, which accounts for about 70 percent of all bottled water sold in the United States.

People spend 10,000 times more per gallon for bottled water than they typically do for tap water. If you get your recommended eight glasses a day from bottled water, you could spend up to \$1,400 annually. The same amount of tap water would cost about 55 cents. Even if you installed a filter device on your tap, your annual expenditure would be far less than what you'd pay for bottled water.

For a detailed discussion on the NRDC study results, check out their Web site at <https://goo.gl/Jxb6xG>.



## Test Results

Our water is monitored for many different kinds of contaminants on a very strict sampling schedule. The information below represents only those substances that were detected; our goal is to keep all detects below their respective maximum allowed levels. The State recommends monitoring for certain substances less than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the year in which the sample was taken.

We participated in the 3rd stage of The Environmental Protection Agency's (EPA) Unregulated Contaminant Monitoring Rule (UCMR3) program by performing additional tests on our drinking water. UCMR3 benefits the environment and public health by providing the EPA with data on the occurrence of contaminants suspected to be in drinking water, in order to determine if EPA needs to introduce new regulatory standards to improve drinking water quality. Contact us for more information on this program.

### REGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
<b>Alpha Emitters</b> (pCi/L)	2016	15	0	0.6	0.6–0.6	No	Erosion of natural deposits
<b>Arsenic</b> (ppb)	2016	10	0	5.3	1.4–5.3	No	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes
<b>Barium</b> (ppm)	2016	2	2	0.43	ND–0.43	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
<b>Chlorine Dioxide</b> (ppb)	2016	[800]	[800]	379	ND–379	No	Water additive used to control microbes
<b>Chlorine</b> (ppm)	2016	[4]	[4]	1.20	ND–1.20	No	Water additive used to control microbes
<b>Chlorite</b> (ppm)	2016	1	0.8	0.877	ND–0.877	No	By-product of drinking water disinfection
<b>Chromium</b> (ppb)	2016	100	100	1.6	ND–1.6	No	Discharge from steel and pulp mills; Erosion of natural deposits
<b>Fecal coliform and <i>E. coli</i></b> (# positive samples)	2016	0	0	0	NA	No	Human and animal fecal waste
<b>Fluoride</b> (ppm)	2016	4	4	0.19	0.074–0.19	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
<b>Nitrate</b> (ppm)	2016	10	10	1.4	ND–1.4	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
<b>Total Coliform Bacteria</b> (Positive samples)	2016	1 positive monthly sample	0	0	NA	No	Naturally present in the environment
<b>Total Organic Carbon</b> (ppm)	2016	TT	NA	4.0	3.4–4.0	No	Naturally present in the environment

Tap water samples were collected for lead and copper analyses from sample sites throughout the community

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	MCLG	AMOUNT DETECTED (90TH% TILE)	SITES ABOVE AL/ TOTAL SITES	VIOLATION	TYPICAL SOURCE
<b>Copper</b> (ppm)	2014	1.3	1.3	0.23	0/30	No	Corrosion of household plumbing systems; Erosion of natural deposits
<b>Lead</b> (ppb)	2014	15	0	2.7	0/30	No	Corrosion of household plumbing systems; Erosion of natural deposits

### SECONDARY SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	SMCL	MCLG	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
<b>pH</b> (Units)	2016	6.5-8.5	NA	NA	7.38–8.53	No	Naturally occurring
<b>Total Dissolved Solids [TDS]</b> (ppm)	2016	500	NA	477	81–477	No	Runoff/leaching from natural deposits

### UNREGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
<b>Sodium</b> (ppm)	2016	3.9	3.2–3.9	Erosion of natural deposits

### UNREGULATED CONTAMINANT MONITORING RULE - PART 3 (UCMR3)

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH
1,4-Dioxane (ppb)	2014	0.52	ND–0.52
Chlorate (ppb)	2013	54	38–54
Chromium [Total] (ppb)	2014	2.7	0.33–2.7
Chromium-6 (ppb)	2014	2.2	0.05–2.2
Strontium (ppb)	2014	140	29–140
Vanadium (ppb)	2014	5.7	0.61–5.7

## Definitions

**AL (Action level):** The concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a community water system shall follow.

**LRAA (Locational Running Annual Average):** The average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters. Amount Detected values for TTHMs and HAAs are reported as LRAAs.

**MCL (Maximum Contaminant Level):** The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

**MCLG (Maximum Contaminant Level Goal):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

**MRDL (Maximum Residual Disinfectant Level):** The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

**MRDLG (Maximum Residual Disinfectant Level Goal):** The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

**NA:** Not applicable

**ND (Not detected):** Indicates that the substance was not found by laboratory analysis.

**pCi/L (picocuries per liter):** A measure of radioactivity.

**ppb (parts per billion):** One part substance per billion parts water (or micrograms per liter).

**ppm (parts per million):** One part substance per million parts water (or milligrams per liter).

**SMCL (Secondary Maximum Contaminant Level):** SMCLs are established to regulate the aesthetics of drinking water like appearance, taste and odor.

**TT (Treatment Technique):** A required process intended to reduce the level of a contaminant in drinking water.